The "Life Jacket": Urgent Antimicrobial Management for Acutely Deteriorating Adult Patients ≥16 years old when Immediate Microbiology Consultant Advice Is Unavailable

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Target Audience: All clinical staff managing acutely deteriorating adult patients (Doctors, Advanced Nurse Practitioners) in NHS Dumfries and Galloway.

Purpose: To provide critical, immediate guidance for antimicrobial management of acutely deteriorating patients with suspected sepsis while microbiology consultant advice is not immediately available, usually out-of-hours or at weekends. This guideline aims to bridge the gap until formal microbiology review is sought by the parent clinical team on the next working day.

Step 1. Introduction: Your Immediate Action Plan

- This guideline is for urgent use in **acutely deteriorating patients with suspected sepsis** when immediate microbiology consultant advice is unavailable.
- **This guideline is NOT a substitute for senior clinical review**. Always escalate within your own clinical team, up to and including the responsible consultant, for urgent clinical decision-making.
- **Patient safety is paramount.** Early, effective antimicrobial therapy AND source control are critical.
- **This guideline focuses on the *microbiology* aspects of urgent management.** Always refer to your local sepsis pathways for overall patient management (e.g., NEWS2, fluid resuscitation, vasopressor support). ***Is escalation to HDU/CCU required?***

Step 2. Initial Assessment & Crucial Steps (as soon as possible)

- **Confirm Diagnosis & Exclude Other Causes:** Is infection still the primary cause? Have other serious non-infectious causes been ruled out (e.g., PE, MI, haemorrhage)?
- **Recognise Sepsis & Act:** Manage physiological derangements appropriately
- **URGENT Senior Clinical Review:** Immediately contact a suitably experienced senior member of your clinical team requesting review
- **Cultures BEFORE Antimicrobials (where possible)**:
    - **Ideally obtain blood cultures *before* starting** OR ***changing* antimicrobials.**
    - **Collect other relevant microbiology samples** (e.g., urine, pus, sputum, CSF, fluid aspirates) based on suspected source.
    - **Do NOT delay urgent antibiotics** if cultures cannot be obtained within a short timeframe in an acutely septic patient.

Take 2 sets of blood cultures NOW, including a set from any indwelling vascular access devices.

Each set should be from a different blood draw to avoid cross contamination.

Step 3. Urgent Antimicrobial Review: Clinical Deterioration

If a patient with suspected sepsis is acutely deteriorating (e.g. worsening NEWS2 ≥7, new organ dysfunction, increasing vasopressor requirement) despite an appropriate empirical antimicrobial therapy, review their antimicrobial regimen urgently:

- **Review Previous Microbiology Results**
  - **This is paramount.** Access the patient's full microbiology history (review last 6 months, or longer if severe/recurrent issues), including regional results through Clinical Portal.
  - **Check for previously isolated resistant organisms:** e.g., MRSA, ESBL- producing or gentamicin-resistant Gram-negatives, P. aeruginosa.
  - **Does the current therapy cover these known resistant organisms?**

If the current therapy does *not cover* a previously isolated and likely causative resistant organism:

IMMEDIATE CHANGE IS REQUIRED

Choose an agent* reported as "S" or "I"

*** avoid agents unsuitable for treating bacteraemias e.g. nitrofurantoin, cefalexin, macrolides, doxycycline, tigecycline**

  - ➢ **Agents reported as "I" require an increased dose, and their use should not be avoided unless clinically unsuitable (e.g. renal impairment, allergy).** All other parameters being equal (as per other parameters below), at an appropriate dose they are equally likely to result in successful treatment as agents reported as "S". Refer to *"Dosing for isolates reported as I: Adults" in the NHS D&G Antibiotic Handbook (*https://rightdecisions.scot.nhs.uk/nhs-dumfries-galloway-antimicrobial-handbook/additional-resources-incl-dosing-generaldrug-specific-advice-pils-sapg-guidance/general-antimicrobial-prescribing/)
- **Review Current Therapy - Is it Working?**
  - **Route**: If on PO therapy, would IV be more appropriate for the patient's acuity and suspected infection source?
  - **Administration:** Have all prescribed doses *actually* been given? Check drug charts and nursing records for missed doses or administration issues, e.g. loss of IV access and rectify.
  - **Dosing:**
    - Is the current antimicrobial **dose appropriate for the patient's weight** (e.g., obese patients may require increased doses)?
    - Is it **adjusted for renal/hepatic impairment** AND **site of infection**?
    - **Is increased exposure dosing being used (if report says "I")?**
- **Do you need to establish source control?** Is there evidence of a deep-seated infection? Appropriate antimicrobials may not improve the patient's clinical status in the presence of an uncontrolled deep-seated source of infection. Consider need for imaging and/or surgical input.

Is your patient on appropriate empirical antimicrobial therapy?

If treatment failure has occurred despite appropriate empirical therapy
(i.e. on a regimen covering known resistant organisms ***OR*** there are no previous results):

Use the Life Jacket

Urgent Senior Clinical Review MUST also be sought

Step 4. Treatment overview – Pick the Right "Life Jacket"

Have microbiology results from the last 6 months available (local and regional) – check for history of e.g. **MRSA** colonisation, and previous **ESBL-producing or gentamicin-resistant Gram negatives, and previous isolates of P. aeruginosa**.

If in doubt, seek senior clinician advice.

Use recent Infection Specialist-advised antibiotic escalation plan, if available

Check the case notes for **previous referrals to** an infection specialist (i.e. Microbiology or Infectious Diseases) – a recent escalation plan for antimicrobials may already be available and should be used in preference to the Life Jacket regimens in this guideline.

** IF THIS IS NOT AVAILABLE **

SELECT AN APPROPRIATE LIFE JACKET

For when there is no escalation plan OR Infection Specialist-advised escalation plan is no longer suitable (e.g. change in clinical information available):

These regimens SHOULD NOT be used if there is clinical suspicion of CNS infection.

Likely causative organisms usually susceptible to empirical CNS infection antibiotic regimens; resistance is extremely rare.
If in doubt, seek advice from senior clinician.

FIRST LINE

No previous results

OR

No previous ESBL/gentamicin-resistant Gram negatives AND no Pseudomonas aeruginosa

	Gram positive cover		Gram negative cover		Anaerobic cover
Not penicillin allergic Not MRSA positive	IV amoxicillin 1g 8-hourly **AND** IV flucloxacillin 2g 6-hourly (if ≥85kg 2g 4-hourly	+	IV gentamicin*,#	+	IV metronidazole 500mg 8-hourly
Penicillin allergy ***or*** History of MRSA	IV vancomycin#	+	IV gentamicin*,#	+	IV metronidazole 500mg 8-hourly

All doses assume normal renal and hepatic function - refer to Renal Drug Database or SPC/BNF for dosing adjustments

***** IV temocillin at increased exposure dosing (See Dosing for isolates reported as I: Adults) can replace gentamicin in patients who are not penicillin allergic and have acute kidney injury or chronic kidney disease with eGFR<20mL/min or decompensated alcoholic liver disease.

Refer to NHS D&G gentamicin (or vancomycin) dosing charts and calculators on the NHS D&G Antimicrobial Handbook website/App: https://rightdecisions.scot.nhs.uk/nhs-dumfries-galloway-antimicrobial-handbook/hospital-adults/iv-gentamicin-and-vancomycin-charts-and-dose-calculators-adults/

SECOND LINE:

Previous ESBL or gentamicin-resistant Gram negatives

OR

Recent isolation of likely clinically-relevant Pseudomonas aeruginosa

	Gram positive cover		Gram negative cover	Anaerobic cover
No MRSA	IV Meropenem* 1g 8-hourly			
History of MRSA	IV vancomycin	+	IV Meropenem* 1g 8-hourly	

All doses assume normal renal and hepatic function - refer to Renal Drug Database or SPC/BNF for dosing adjustments

***** Review recent P. aeruginosa susceptibilities, if available. Avoid meropenem if resistant, and use alternative agent reported as either I or S - discuss with senior clinician.

Step 5. Referring to Microbiology for Next Working Day Review

For all acutely deteriorating patients where you have made use of this guideline (whether or not you have changed antibiotics) ensure:

- It is clearly documented in the notes this guidance has been used, and requires follow up discussion.

AND

- Appropriate handover occurs to the medical team looking after the patient the next working day to ensure the patient is discussed with a consultant microbiologist when they are next available for advice.

When this guideline has been used, senior clinicians (i.e. Consultants, Specialist Grades, GCH Doctors) are strongly advised to seek advice from a consultant microbiologist the next working day / Monday morning.

This is essential for Antimicrobial Stewardship.

Acknowledgements

This document was developed for local use within NHS Dumfries and Galloway from a similarly named document initially written by NHS Ayrshire & Arran.

Appendix 1: Quick Reference Guide

The "Life Jacket"

Urgent Antimicrobial Management for Acutely Deteriorating Adult Patients ≥16 years old when Immediate Microbiology Consultant Advice Is Unavailable

Quick reference guide – for detailed advice, refer to full guideline of the same name

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ACUTE DETERIORATION – Is escalation to CCU/HDU required?
e.g. worsening NEWS2 ≥7, new organ dysfunction, increasing vasopressor requirement

Rapid Clinical Assessment:
Sepsis most likely explanation?

No → Manage non infective cause appropriately; **this guideline does not apply.**

Yes → Provide appropriate resuscitation (as per sepsis pathways)
Urgent Senior Clinical Review.
Blood cultures x2.
Review

Previous Microbiology Results
Check at least 6 months
Resistant organisms e.g. :
- MRSA
- ESBL-producing Gram negatives
- Gentamicin-resistant Gram negatives
- Pseudomonas aeruginosa

Current treatment
Previous resistances covered?
Dose correct (including "I")?
Dose missed?
Route appropriate?

Source control
Is there a deep-seated infection?
If so, can it be drained?
Seek surgical input.

Is antimicrobial escalation required?
If yes, is there a recent suitable escalation plan from an Infection Specialist?

Yes → **Life Jacket not required** *Follow escalation plan.*

No: *use the Life Jacket*

No resistant organisms in previous cultures OR no cultures at all → **PICK FIRST LINE**

There are resistant organisms → **PICK SECOND LINE**

REMEMBER ANTIMICROBIAL STEWARDSHIP
Senior Clinicians should seek Consultant Microbiology advice the next working day